IN THE CLAIMS

Please cancel originally filed Claims 1-17 in favor of new Claims 18-29.

18. (New Claim) A device for receiving a light beam from a light source used in the analysis of biological molecules linked to a fluorophore, wherein said biological molecules are affixed to a top surface of a waveguide support capable of supporting total internal reflection and further comprising a bottom surface and at least one edge surface, said device comprising means for directing said light beam into said edge of said waveguide support.

19. (New Claim) The device of claim 18, further comprising a transparent hexahedron to direct said light beam into said edge of said waveguide support to effect total internal reflection, placed between said light source and said waveguide support, wherein said transparent hexahedron occupies the same plane as said light beam and revolves around an axis perpendicular to said light beam.

20. (New Claim) The device of claim 1, further comprising an optical wedge to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said optical wedge is placed between said light source and said waveguide support and revolves around an axis approximating said light beam.

21. (New Claim) The device of claim 1, further comprising a cylindrical lens to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said cylindrical lens is placed between said light source and said waveguide support for focusing said light beam into a shape smaller than said edge of said waveguide support, and wherein said cylindrical lens moves perpendicular to the plane of said light beam.

22. (New Claim) The device of claim 1, wherein said means comprises a mirror to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said mirror is placed adjacent to said waveguide.

23. (New Claim) The device of claim 1, further comprising a diffraction grating to selectively allow light of a specific wavelength to excite said fluorophore, wherein said diffraction grating is placed between said light source and said waveguide support.

24. (New Claim) The device of claim 1, further comprising an optical prism to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said optical prism is placed adjacent to said waveguide support.

25. (New Claim) The device of claim 1, further comprising a transparent liquid to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said transparent liquid is placed between said waveguide support and said optical prism and possesses a refractive index about equal to the refractive indices possessed by said waveguide support and said optical prism.

26. (New Claim) The device of claim 1, further comprising bandpass filters to separate emission spectra, wherein said bandpass filters are placed between said waveguide support and a charge – coupled device positioned to receive emitted light from said fluorophores.

27. (New Claim) A device for receiving a light beam from a light source used in the excitation, detection, and analysis of biological molecules linked to a fluorophore, wherein said biological molecules are affixed to a top surface of a waveguide support further comprising a bottom surface and at least one edge surface, said device comprising:

a) a transparent hexahedron to direct said light beam into said edge of said waveguide support to cause effect internal reflection, wherein said transparent hexahedron is adjacent to said light source, occupies the same plane as said light beam, and revolves around an axis perpendicular to said light beam;

b) an optical wedge to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said optical wedge is adjacent to said transparent hexahedron and revolves around an axis approximating said light beam;

c) a cylindrical lens to direct said light beam into said edge of said waveguide support to effect total internal reflection, wherein said cylindrical lens is adjacent to said optical wedge, focuses said light beam into a shape smaller than said edge of said waveguide support, and moves perpendicular to the plane of the light beam; and

d) a mirror to direct said light beam into said edge of said waveguide support to cause total internal reflection, wherein said mirror is adjacent to said cylindrical lens.

28. (New Claim) A method for detecting and analyzing a specific nucleic acid sequence comprising:

a) inserting a waveguide support into a fluorescence detector, said waveguide support being spatially situated between a light source and a charge – coupled device in said fluorescence detector, wherein oligonucleotides of known sequences are fixed to said waveguide support at known positions, wherein at least one said oligonucleotide possesses at least one fluorescent nucleotide;

b) exciting said fluorescent nucleotide by directing said light source to said waveguide support to cause total internal reflection;

c) detecting emission from said fluorescent nucleotide with said charge – coupled device; and

d) analyzing said emission on a personal computer.

29. (New Claim) A method of analyzing the sequence of a polynucleotide of interest, comprising the steps of:

a) attaching an array of oligonucleotide primers having known sequences to a solid support at known locations, wherein said solid support may act as a waveguide;

b) hybridizing said polynucleotide of interest to the array of oligonucleotide primers to generate double stranded oligonucleotides;

c) subjecting the double stranded oligonucleotides to a sequence specific single base polymerization reaction to extend the annealed primers by the addition of a fluorescently – labeled terminating nucleotide, wherein said primers may be extended by any fluorescently – labeled terminating nucleotide which is complimentary to the polynucleotide of interest;

d) removing the polynucleotide of interest from the array of oligonucleotide primers;

e) inserting said support into a fluorescence detector, wherein said support is spatially situated between a light source and a charge – coupled device in said fluorescence detector;

f) exciting said fluorescent nucleotide by directing said light source into said support to cause total internal reflection;

g) detecting emission from said fluorescent nucleotide with said charge – coupled device; and

h) analyzing said emission on a personal computer.